

*Serial No.: 10/684,117  
Response to Office Action dated December 14, 2005*

Remarks

Claims 1-100 are pending in the present application wherein claims 1-68 have been withdrawn and claims 69-100 stand rejected under 35 USC §103.

Claim Rejections-35 USC §103

Claims 69 and 78-100 are rejected under 35 USC §103(a) as being unpatentable over Spehner, US patent number 5, 232, 779. The Examiner asserts that the elements of claim 69 are suggested by Spehner and then correctly indicates that Spehner does not specifically disclose that the additives are absorbed on the fiber surface. The Examiner then concludes that upon drying, additives would absorb on the surface of the fiber therefore rendering this limitation obvious. The Applicant respectfully disagrees with the Examiner and contends that the Examiner has misconstrued the claim and misinterpreted the reference. Accordingly, the Examiner has not made a *prima facie* showing to support the rejection as will be discussed below.

Claim 69 requires, *inter alia*, a suspension drawn into the lumen to beneficiate the fiber whereby the natural voids of the lumen are preserved by the suspension. In contradistinction, Spehner does not teach nor suggest the problem sought to be addressed by the claimed invention nor does it teach nor suggest the solution to the problem. A problem with the prior art as described in the present application on page 2 beginning at line 14 is that during extrusion, the lumen in the fiber collapses under compressive pressure. When the lumen collapses, the natural voids in the fiber are lost causing the natural density of the fiber to increase. Because the density of the fiber is increased, the mass of the composite also increases. This increased density runs counter to the advantages of using fiber, which is mass reduction and stiffness enhancement. The claimed invention provides a beneficiated fiber wherein the lumen does not collapse during extrusion such that the natural voids of the lumen are preserved causing the fiber to maintain natural density and strength characteristics.

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Spehner does not suggest any problem with collapsing lumen. It therefore does not suggest any solution whereby the natural voids of the lumen are preserved by a suspension being drawn into the lumen as required by claim 69. Spehner simply seeks to produce a substitute material for asbestos by treating plant fibers with an aqueous solution of a metal compound. Nowhere does Spehner suggest an aqueous solution drawn into lumen of the fiber which is capable of preserving the natural voids of the lumen. The Examiner points to language in column 3, lines 12-23 of Spehner for a suggestion that additives can be used such as lubricants, flame retardant compounds, waterproofing agents and reducing agents. These additives, are first of all, not suggested by Spehner to be drawn into the lumen but more importantly, do not suggest any solution which is capable of preserving the natural voids of the lumen. Pointing to the same language relied upon by the Examiner in Spehner, it is evident that these additives are simply included depending upon the application purpose of the fibers. For example, bleaching can be included to achieve a whitening effect, lubricant is added to achieve a tribologic effect, flame retardant is added to achieve a flame retardant finish. Likewise, bactericides or water repellants may be added. None of these additives addresses the problems caused by collapsing lumen. The Examiner cannot conclude that those teachings would lead one skilled in the art to employ a suspension drawn into the lumen whereby the natural voids of the lumen are preserved by the suspension. Since there is no suggestion in the art cited to arrive at the recited elements in claim 69, Applicant respectfully contends that the Examiner has not made a *prima facie* showing of obviousness. Reconsideration and withdrawal of the rejection of claims 69 and 78-100 under 35 USC §103(a) is therefore requested.

Claims 69-77 are rejected under 35 USC §103(a) as being unpatentable over Spehner in view of Stucky et al., US patent number 6, 344, 268. The Examiner asserts that Spehner discloses plant fibers such as bast, flax, hemp, jute and cotton that can be incorporated into a

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matrix as per claims 69 and 78-84. Additionally, the Examiner asserts that Spehner discloses fibers being impregnated with a solution comprising a carbonate, binding agent and an oxidizing agent such as synthetic elastomers, phenolic resins, resols, melanie resins or epoxy resins as per claims 75-77. The Examiner correctly indicated that Spehner does not teach the use of a blowing agent and proceeds to rely upon Stucky for a teaching of the blowing agent concluding that it would have been obvious to one of ordinary skill in the art to add a chemical blowing agent to the suspension in order to reduce the density and weight of the suspension when it is incorporated into the fiber. Although the Examiner has not pointed out the claims to which these assertions apply, the Applicant assumes, by process of elimination, that the Examiner applied these assertions to claims 70-74 and requests confirmation from the Examiner regarding application of the rejection to these claims.

As discussed above, Spehner lacks a teaching or any suggestion that would lead one skilled in the art to employ a suspension drawn into the lumen to preserve the natural voids of the lumen. For brevity, these arguments will not be repeated here except to say that they apply equally to this rejection and that the Applicant respectfully requests reconsideration and withdrawal of the rejection of claims 69 and 78-84.

Although the Examiner asserts that Spehner discloses fibers being impregnated with a solution comprising a carbonate, binding agent and an oxidizing agent such as synthetic elastomers, phenolic resins, resols, melanie resins or epoxy resins as per claims 75-77, the Spehner reference, for the reasons discussed above, does not teach nor suggest the limitations recited in claim 69 from which these claims depend. Additionally, since these claims also depend from intermediate claim 70 requiring that the suspension include a chemical blowing agent, a carrier and a catalyst, the Examiner has improperly rejected these claims under Spehner

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since she has admitted that Spehner does not teach nor suggest the chemical blowing agent.

Withdrawal of the rejection of claims 75-77 is therefore requested.

With respect to claims 70-74 Applicant asserts that there is no suggestion to combine Stucky with Spehner and furthermore asserts that such a combination, even if forced, would not result in the solution of claim 70. Claim 70 requires a suspension which includes a chemical blowing agent, a carrier and a catalyst which is drawn into the lumen of a fiber whereby the natural voids of the lumen are preserved by the suspension. Neither of these references teaches nor suggest preservation of the natural voids of the lumen. In fact, Stucky teaches away from preserving the natural voids of the lumen since it teaches a process which is similar to that discussed in the background of the invention beginning on page 1 at line 24 which is quoted as follows:

The manufacture of the composite typically involves extruding of the polymeric material and the fiber. During the manufacture thereof, an extruder melts the polymeric material and mixes the melted polymeric material with the fiber. As a result of the mixing, the melted polymeric material becomes imbedded with the fiber. A bonding agent may be added to the mixture to aid in achieving an adhesive bond between the fiber and the polymeric material. Many other "additives" may be introduced, such as, stabilizers, antioxidants, UV absorbers, fillers and extenders, pigments, process aids and lubricants, impact modifiers, bactericides and other materials that enhance physical and/or chemical properties as well as processing. A chemical blowing agent or gas may also be introduced into the mixture. While in the extruder, the blowing agent decomposes, disbursing a gas, such as, nitrogen or carbon dioxide, into the melted polymeric material. After the polymeric material, fiber and other additives are mixed, the melted mixture exits the extruder through a die. As

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the polymeric material exits the die, the extrusion pressure is reduced to atmosphere and the polymeric material begins to cool causing the entrained gases to expand as bubbles within the melted mixture. The bubbles are trapped by the surrounding polymeric material and form voids in the composite. These voids reduce the overall density and weight of the composite.

Often during extrusion, the lumen in the fiber collapses under compressive pressure. When the lumen collapses the natural voids in the fiber are lost causing the natural density of the fiber to increase.

The chemical blowing agent disclosed by Stucky is used precisely as described in the background as an additive to a polymeric material and fiber mixture in an extrusion process and therefore has the problems discussed in the background. The result being bubbles trapped by surrounding polymeric material to form voids in the composite. In the process disclosed by Stucky, the chemical blowing agent is mixed into the compound during blending or at the feed throat of the extruder resulting in bubbles trapped by surrounding polymer as disclosed in column 5 lines 24-30. Nowhere does Stucky or Spehner teach or suggest that the chemical blowing agent enters or is drawn into the lumen to preserve the voids therein. The Examiner therefore has not shown any suggestion to arrive at the claim limitations of claim 70. Withdrawal of the rejection of claims 70-74 is therefore respectfully requested.

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Conclusion

For the reasons discussed here, the Applicant contends that the application is in condition for allowance and passage thereof to issue is respectfully requested. If the Examiner wishes to discuss anything presented here in order to further prosecution of the present application, she is invited to contact the undersigned Attorney for the Applicant. Please charge any additional fees associated with this Preliminary Amendment to Deposit Order Account No. 50-1581.

Respectfully submitted,

  
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Dated: March 9, 2006

PTO Customer No.: 29450